DINOSAURS!

•DISCOVER THE GIANTS OF THE PREHISTORIC WORLD•

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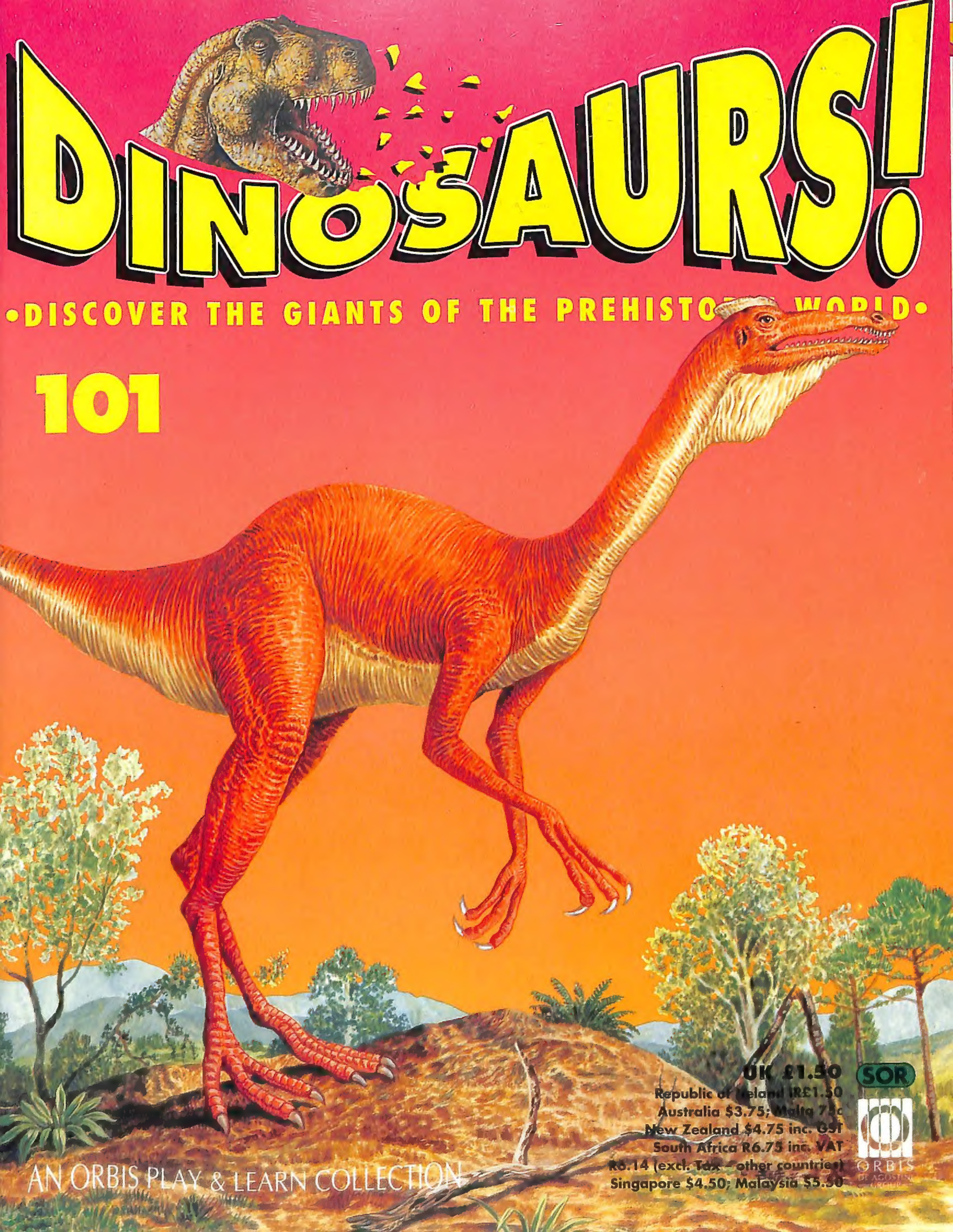

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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •

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PELICANIMIMUS

This strange dinosaur had a throat pouch just as today's pelicans do.

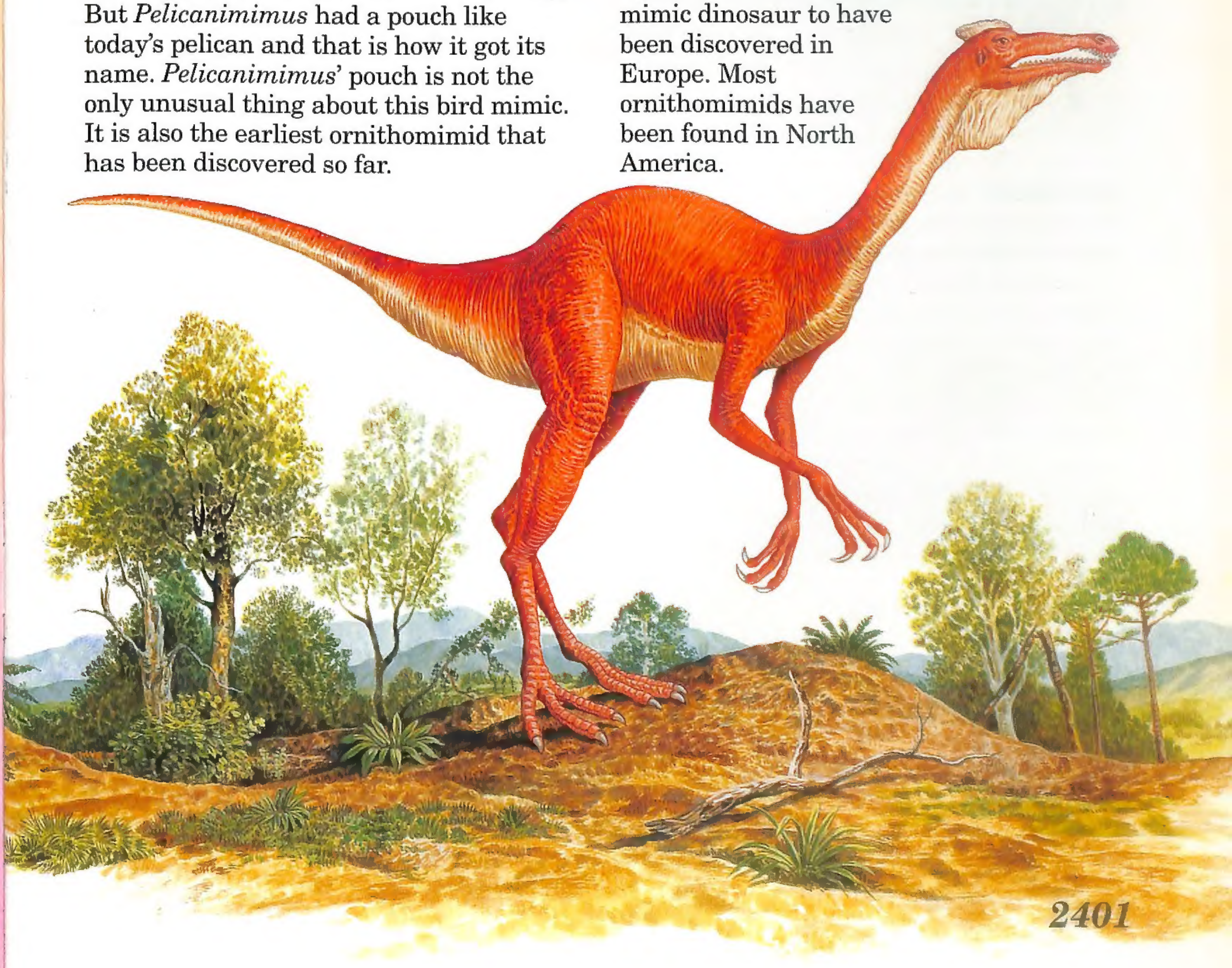
Pelicanimimus was an ornithomimid, or 'bird mimic' dinosaur. Experts usually compare members of the ornithomimid group of dinosaurs to birds such as ostriches and emus which are alive today. But *Pelicanimimus* had a pouch like today's pelican and that is how it got its name. *Pelicanimimus*' pouch is not the only unusual thing about this bird mimic. It is also the earliest ornithomimid that has been discovered so far.

ON ITS OWN

Most bird mimics lived towards the end of the Age of the Dinosaurs. *Pelicanimimus* appeared about 60 million years earlier, in the Early Cretaceous Period.

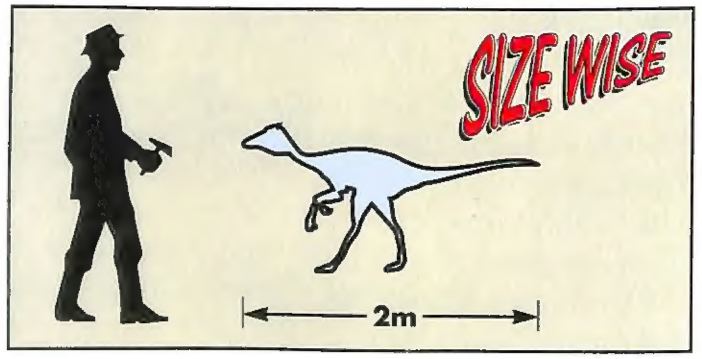
FAR OUT

Pelicanimimus was unusual in another way, too. Its fossil remains were found in Spain. It is the first bird mimic dinosaur to have been discovered in Europe. Most ornithomimids have been found in North America.



MONSTER FACTS

- **NAME:** *Pelicanimimus* (pel-i-can-i-mime-us) means 'pelican mimic'
- **GROUP:** dinosaur
- **SIZE:** 2m long
- **FOOD:** small animals
- **LIVED:** about 115 million years ago in the Early Cretaceous Period in Spain



BIG POUCH

The fossilized remains of *Pelicanimimus* found so far show that it had a small crest on its head. Scientists also found an impression of *Pelicanimimus*' skin in the rocks surrounding the fossilized bones. The experts were fascinated by the shape of the throat. After studying the rocks carefully, they decided that the dinosaur must have had a throat pouch like today's pelican.

SMOOTH AND SPIKY

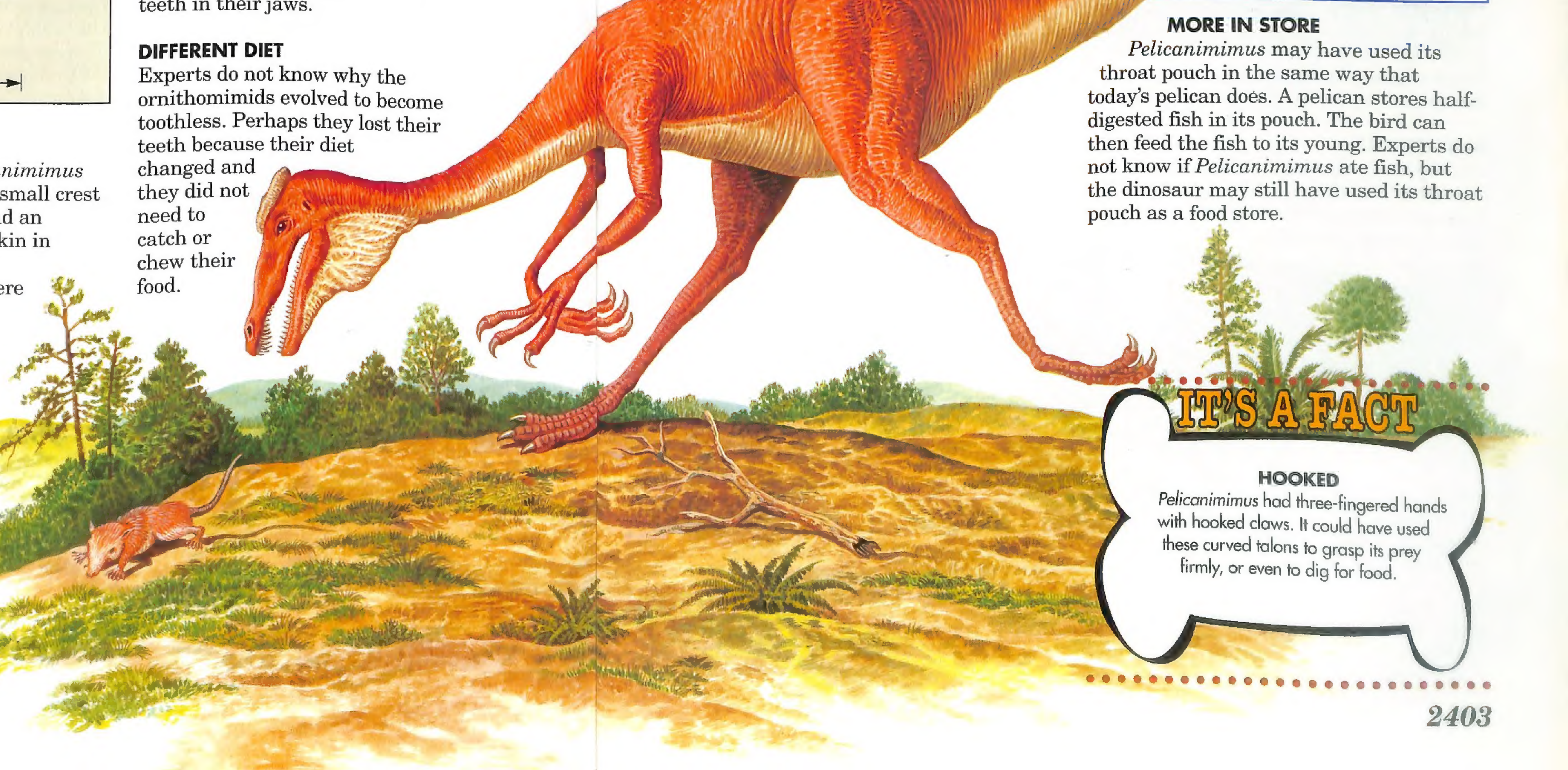
Pelicanimimus differed in another important way from other bird mimic dinosaurs such as *Ornithomimus*. *Ornithomimus* had a toothless beak but the long, narrow jaws of *Pelicanimimus* bristled with teeth. Its lower jaw was lined with tiny teeth, while the upper jaw had a cluster of longer teeth at the front.

ALL CHANGE

The fact that *Pelicanimimus* had teeth told experts that it was quite a primitive ornithomimid. All the bird mimic fossils found in the Late Cretaceous, long after *Pelicanimimus* became extinct, had no teeth in their jaws.

DIFFERENT DIET

Experts do not know why the ornithomimids evolved to become toothless. Perhaps they lost their teeth because their diet changed and they did not need to catch or chew their food.



Scientists think that *Pelicanimimus* fed on small animals. It probably caught them in its sharp-clawed hands, then chewed them up with its rows of teeth. The pouch in its throat may have been used to store extra food.

Pelicanimimus* is the only bird mimic dinosaur that had a pouch as today's pelicans do (right). However, scientists do not know if it could catch fish.

ANIMAL EATER

How did *Pelicanimimus* feed and what did it eat? No one knows for sure, but experts think it probably ate a range of small animals.

MORE IN STORE

Pelicanimimus may have used its throat pouch in the same way that today's pelican does. A pelican stores half-digested fish in its pouch. The bird can then feed the fish to its young. Experts do not know if *Pelicanimimus* ate fish, but the dinosaur may still have used its throat pouch as a food store.

IT'S A FACT

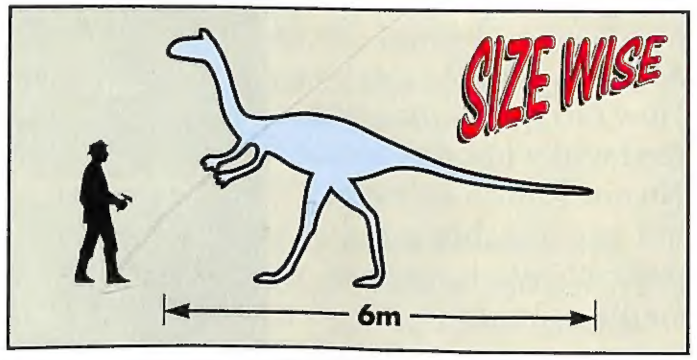
HOOKED

Pelicanimimus had three-fingered hands with hooked claws. It could have used these curved talons to grasp its prey firmly, or even to dig for food.

CRYOLOPHOSAURUS

***Cryolophosaurus* hunted for food in the region we now call Antarctica.**

Only a few dinosaur fossils have been found in Antarctica, and the first was not discovered until the 1980s. *Cryolophosaurus* is the first meat-eater excavated there.



HOT AND COLD

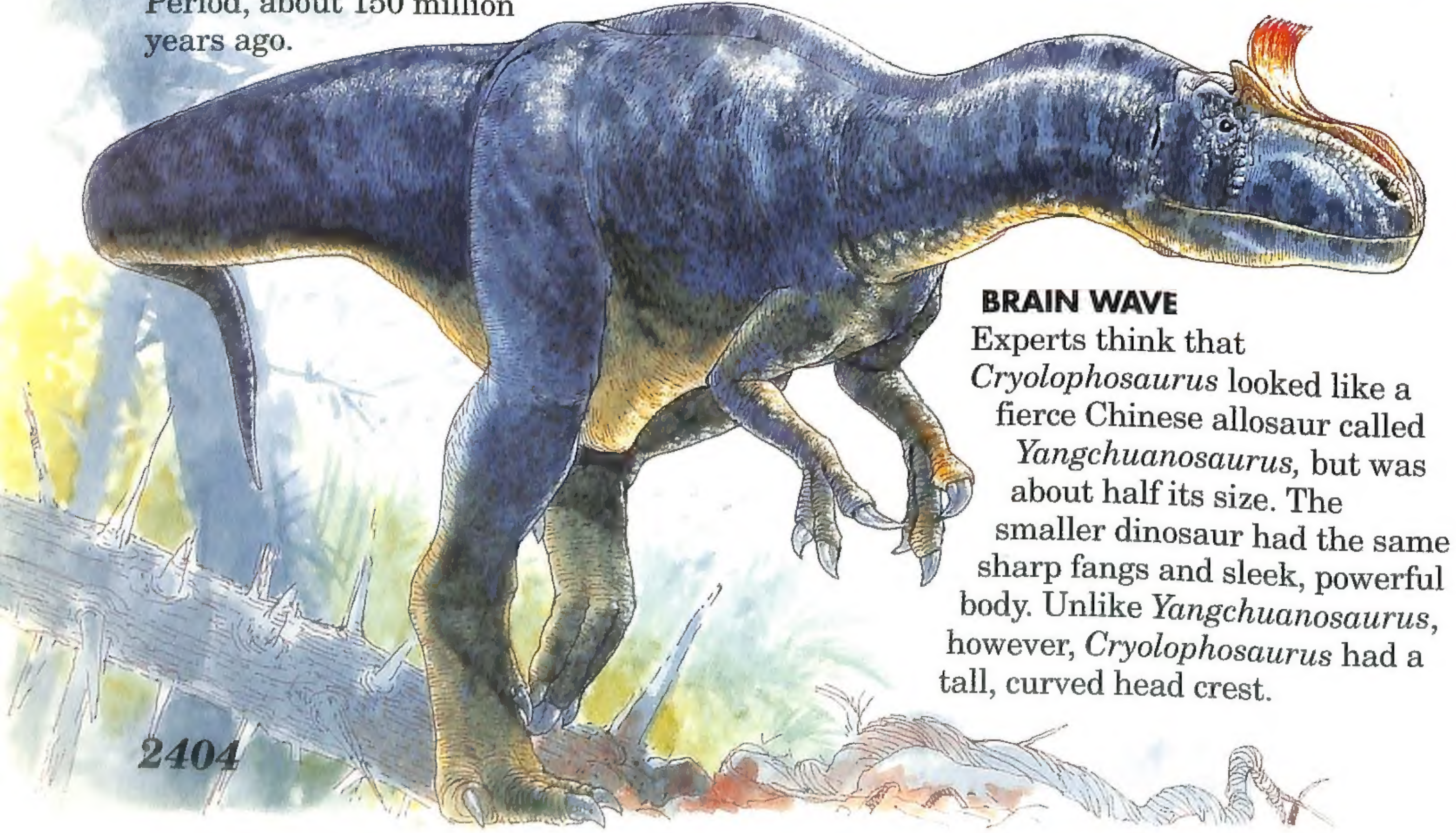
Antarctica was not covered in snow and ice in the Age of the Dinosaurs. The climate was warmer all over the world, and lots of dinosaurs may have lived in Antarctica.

MONSTER FACTS

- **NAME:** *Cryolophosaurus* (cry-oh-loaf-o-saw-rus) means 'frozen crest'
- **GROUP:** dinosaur
- **SIZE:** 6m long
- **FOOD:** meat
- **LIVED:** about 200 million years ago in the Early Jurassic Period in Antarctica

BUILT TO KILL

Cryolophosaurus was an allosaur-like dinosaur. The allosaurs were the most fearsome killers of the Late Jurassic Period, about 150 million years ago.



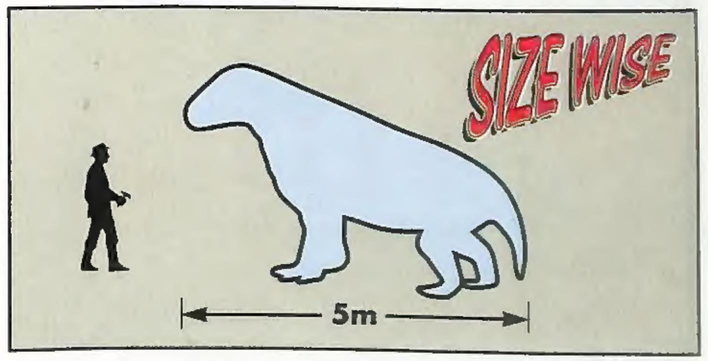
BRAIN WAVE

Experts think that *Cryolophosaurus* looked like a fierce Chinese allosaur called *Yangchuanosaurus*, but was about half its size. The smaller dinosaur had the same sharp fangs and sleek, powerful body. Unlike *Yangchuanosaurus*, however, *Cryolophosaurus* had a tall, curved head crest.

MOSCHOPS

Massive *Moschops* was a mammal-like reptile that grew as big as an ox.

Moschops was a therapsid. The therapsids were a group of mammal-like reptiles that flourished from about 220 million years ago. Some were no bigger than a lizard, but *Moschops* was huge.



HEAVYWEIGHT

As large as today's ox and much heavier, *Moschops* had a bulky, barrel-shaped body and a particularly large head.

MONSTER FACTS

- **NAME:** *Moschops* (mos-kops) means 'calf eye'
- **GROUP:** mammal-like reptile
- **SIZE:** 5m long
- **FOOD:** plants
- **LIVED:** about 225 million years ago in the Late Permian Period in Africa

TOUGH STUFF

Its short jaws were filled with peg-like teeth. These were not sharp enough to let *Moschops* slice through tough food, so experts think it had to swallow twigs and cones whole.

HEAD BANGER

Moschops had a very thick skull, just as some goats and sheep do today. These animals need this protection because the males have head-butting contests to see who will lead the herd. Perhaps groups of *Moschops* had head-butting contests too.

Atlas of finds

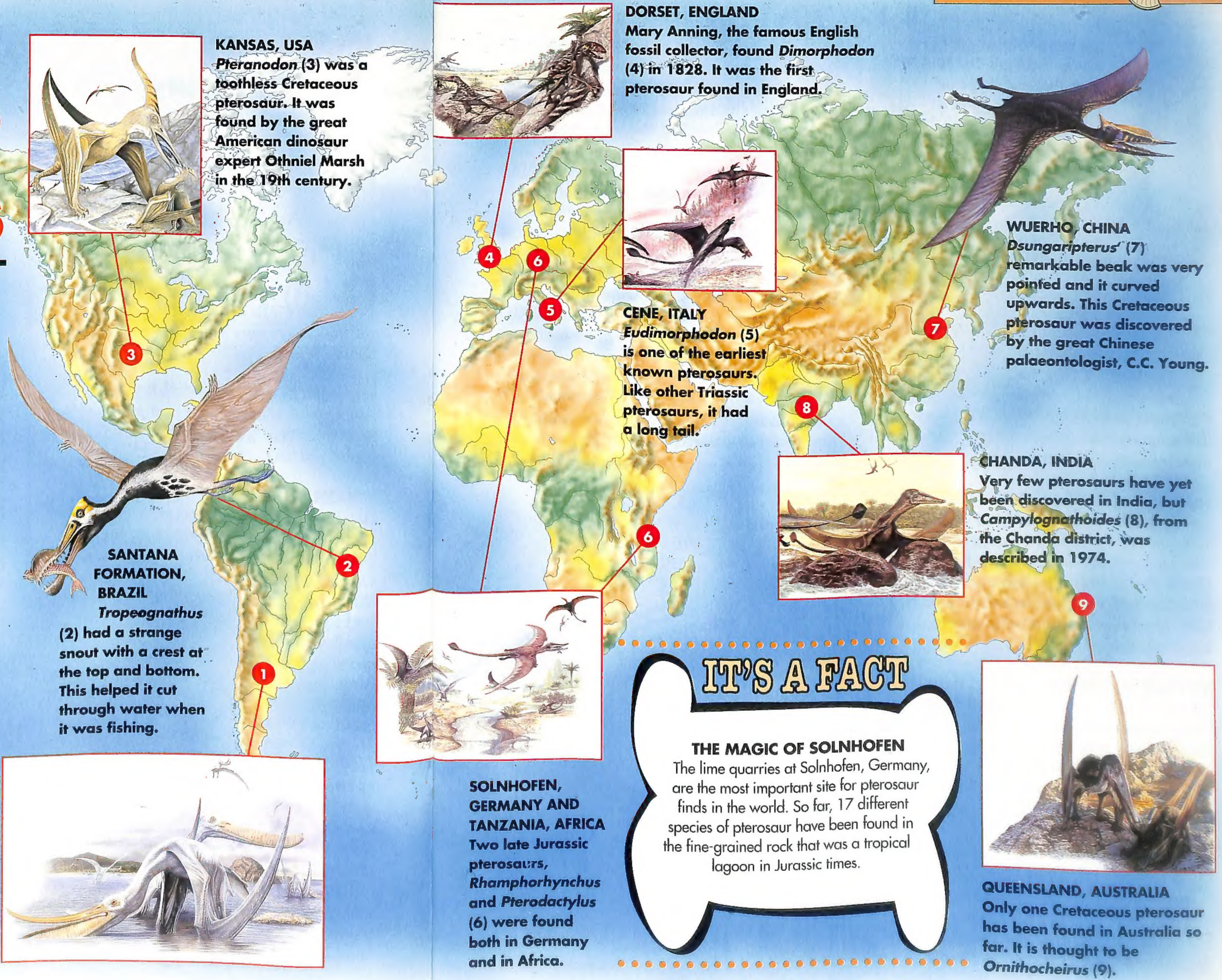
pterosaurs

Palaeontologists have found pterosaur fossils on every continent except Antarctica.

The winged reptiles, the pterosaurs, first flapped across the skies of our planet 220 million years ago, about 70 million years before the first bird. They existed for 150 million years, but became extinct at the same time as the dinosaurs.

MANY AND VARIED

There were probably as many varieties of pterosaurs as there are of birds today, but we have only found fossils of a few of them so far. We know pterosaurs ranged in size from the largest flying animal of all time, which had a 12m wingspan, to creatures the size of sparrows.



SAN LUIS, ARGENTINA
Pterodaustro (1) had very strange teeth in its lower jaw. They were long, thin and flexible, and were just like bristles. *Pterodaustro* probably used them for sieving its food from water.

SANTANA FORMATION, BRAZIL
Tropeognathus (2) had a strange snout with a crest at the top and bottom. This helped it cut through water when it was fishing.

KANSAS, USA
Pteranodon (3) was a toothless Cretaceous pterosaur. It was found by the great American dinosaur expert Othniel Marsh in the 19th century.

DORSET, ENGLAND
Mary Anning, the famous English fossil collector, found *Dimorphodon* (4) in 1828. It was the first pterosaur found in England.

CENE, ITALY
Eudimorphodon (5) is one of the earliest known pterosaurs. Like other Triassic pterosaurs, it had a long tail.

SOLNHOFEN, GERMANY AND TANZANIA, AFRICA
Two late Jurassic pterosaurs, *Rhamphorhynchus* and *Pterodactylus* (6) were found both in Germany and in Africa.

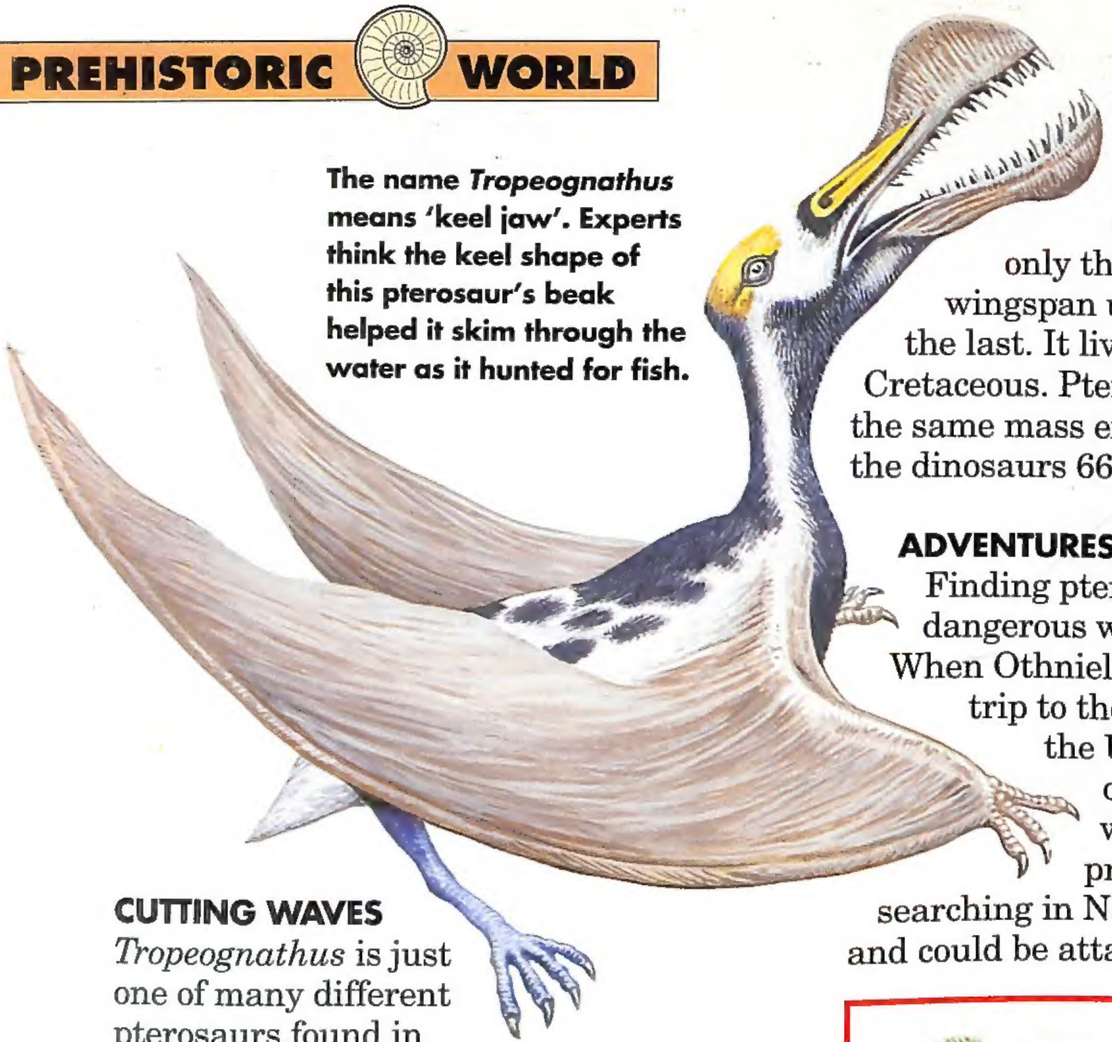
WUERHO, CHINA
Dsungaripterus (7) remarkable beak was very pointed and it curved upwards. This Cretaceous pterosaur was discovered by the great Chinese palaeontologist, C.C. Young.

CHANDA, INDIA
Very few pterosaurs have yet been discovered in India, but *Campylognathoides* (8), from the Chanda district, was described in 1974.

IT'S A FACT

THE MAGIC OF SOLNHOFEN
The lime quarries at Solnhofen, Germany, are the most important site for pterosaur finds in the world. So far, 17 different species of pterosaur have been found in the fine-grained rock that was a tropical lagoon in Jurassic times.

QUEENSLAND, AUSTRALIA
Only one Cretaceous pterosaur has been found in Australia so far. It is thought to be *Ornithocheirus* (9).



The name *Tropeognathus* means 'keel jaw'. Experts think the keel shape of this pterosaur's beak helped it skim through the water as it hunted for fish.

CUTTING WAVES

Tropeognathus is just one of many different pterosaurs found in the rocks of the Santana Formation in north-eastern Brazil. It lived in the Cretaceous Period and fished in the freshwater lakes of the area. Experts think that its strange beak crests worked like the keel of a boat to help it cut through the water more quickly and to keep it balanced as it did so.

SIEVING FOR FOOD

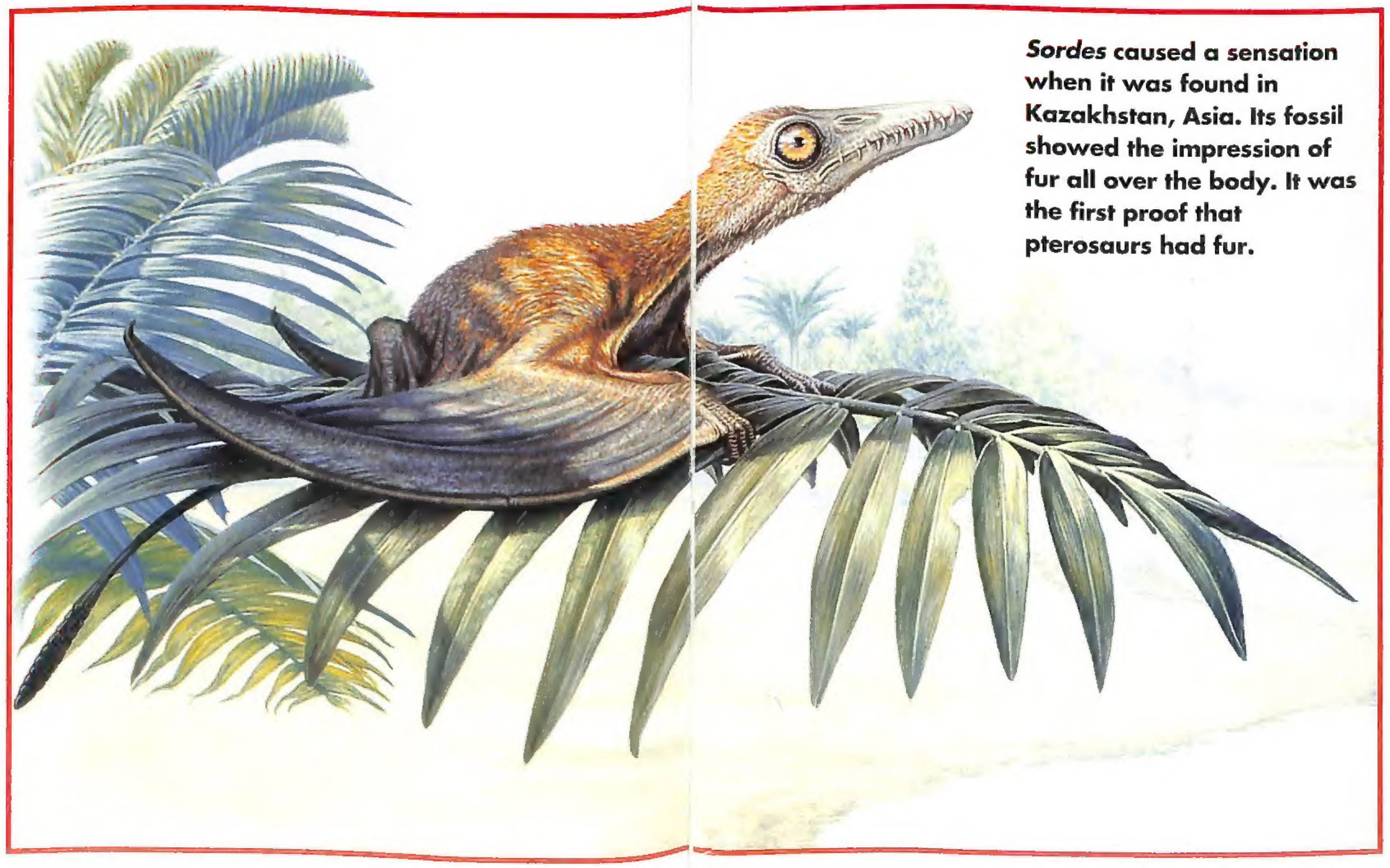
Unlike birds, most pterosaurs had teeth. Their teeth were adapted to suit the food they caught and ate. Fish-eating pterosaurs, such as *Tropeognathus*, had long, spiky teeth to grip slippery fish. *Pterodaustro*, which was found in Argentina, was a filter feeder. It stood in water and sieved small organisms through the 'bristles' in its lower jaw. When its sieve was full, *Pterodaustro* mashed up its food with the short teeth in its upper jaw. This fascinating pterosaur was found by the palaeontologist José Bonaparte.

LAST PTEROSAUR

Quetzalcoatlus was not only the largest pterosaur, with a wingspan up to 12m, it was probably the last. It lived at the end of the Cretaceous. Pterosaurs disappeared in the same mass extinction that wiped out the dinosaurs 66 million years ago.

ADVENTURES OUT WEST

Finding pterosaurs could be dangerous work in the 19th century. When Othniel Marsh went on a field trip to the Western Territories of the USA in 1872, all members of his expedition carried a weapon of some sort for protection. They were searching in Native American country and could be attacked at any time.



***Sordes* caused a sensation when it was found in Kazakhstan, Asia. Its fossil showed the impression of fur all over the body. It was the first proof that pterosaurs had fur.**

GOOD LUCK

That particular expedition was lucky. It was not attacked and they found *Pteranodon* bones that showed this pterosaur had a 7m wingspan.

ASIAN PTEROSAURS

Chinese *Dsungaripterus* is one of the strangest looking pterosaurs. Its beak was curved and pointed. This may have helped it poke among rocks for shellfish, which it cracked open with its strong back teeth.

FURRY FLIERS

Sordes, another Asian pterosaur, lived millions of years earlier than *Dsungaripterus* and was much smaller. The fossilized impressions left by its fur have made some experts think that all pterosaurs were warm-blooded.

***Dsungaripterus* fossils were found in China.**

PTEROSAURS IN EUROPE

Eudimorphodon used its long tail as a rudder to help it balance, as it skimmed the waves looking for fish. *Dimorphodon* lived later than *Eudimorphodon* and was probably a fish-eater, too.

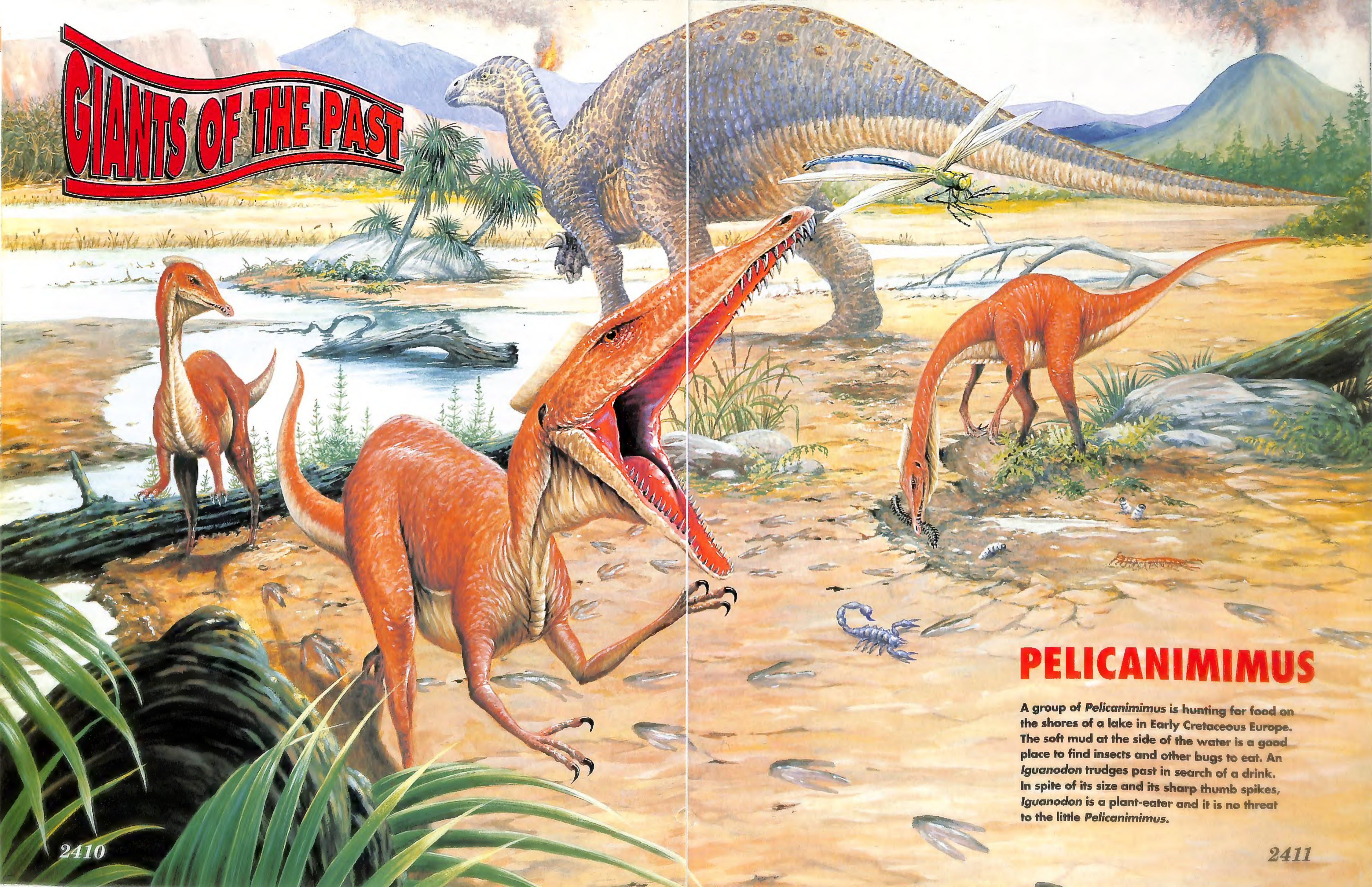
SOLNHOFEN PTEROSAURS

As well as *Rhamphorhynchus* and *Pterodactylus*, many other Jurassic pterosaurs were beautifully preserved in the limestone quarries of Solnhofen. They included *Gnathosaurus*, *Ctenochasma*, *Scaphognathus*, *Germanodactylus*, *Anurognathus* and *Odontorhynchus*.

Is it true that the very first pterosaur to be discovered was found in Europe?

Yes. It was found in Eichstatt in Bavaria, Germany, in the middle of the 18th century. It was kept in a private natural history museum where it was studied by Cosimo Collini, keeper of the museum. Although Collini described the fossil well, he decided that it did not belong to any known animal. We now know that it was the remains of the pterosaur *Pterodactylus*.

GIANTS OF THE PAST

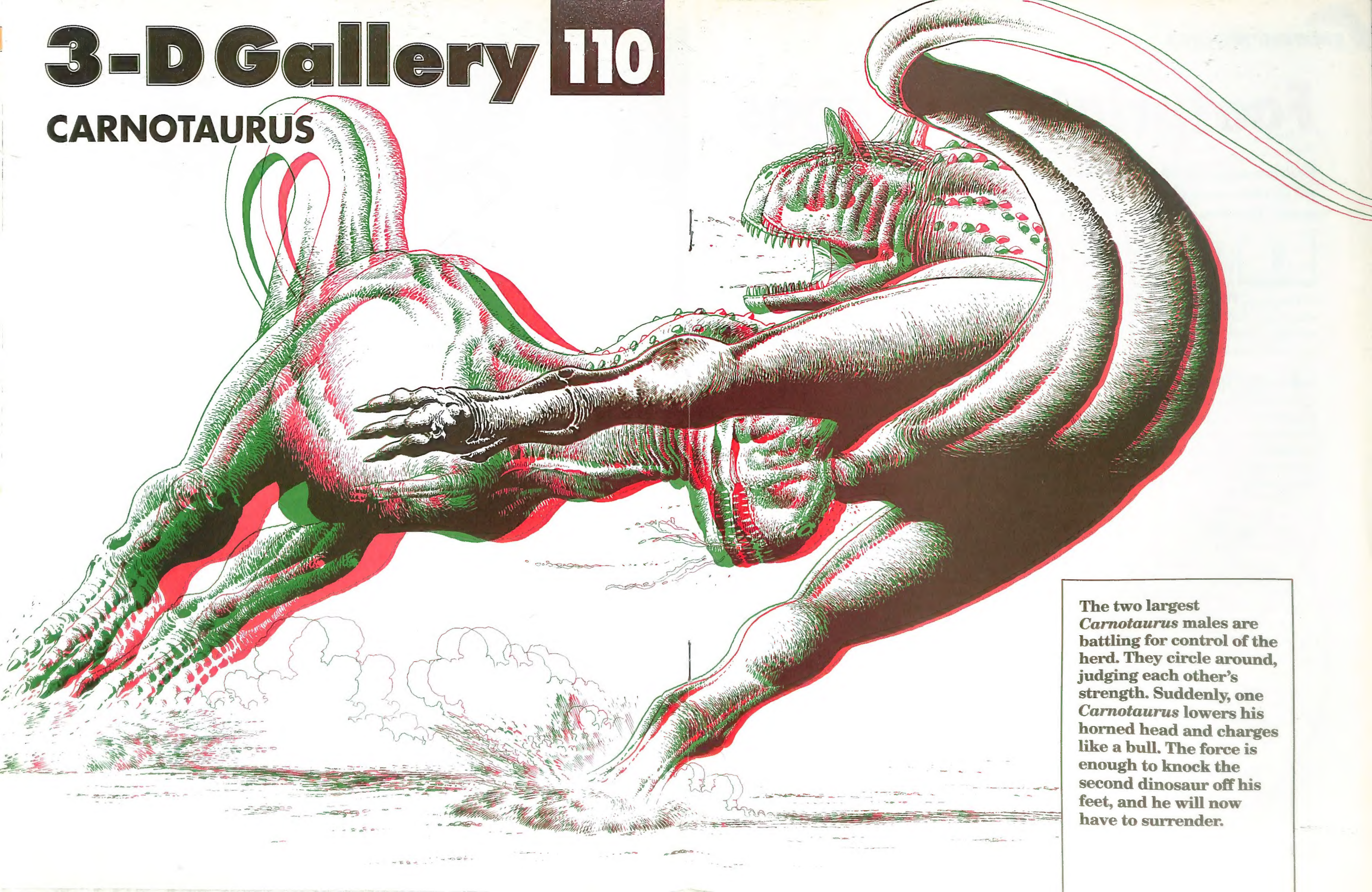


PELICANIMIMUS

A group of *Pelicanimimus* is hunting for food on the shores of a lake in Early Cretaceous Europe. The soft mud at the side of the water is a good place to find insects and other bugs to eat. An *Iguanodon* trudges past in search of a drink. In spite of its size and its sharp thumb spikes, *Iguanodon* is a plant-eater and it is no threat to the little *Pelicanimimus*.

3-D Gallery 110

CARNOTAURUS



The two largest *Carnotaurus* males are battling for control of the herd. They circle around, judging each other's strength. Suddenly, one *Carnotaurus* lowers his horned head and charges like a bull. The force is enough to knock the second dinosaur off his feet, and he will now have to surrender.

Footprints and eggs

Here are some recent discoveries that tell us even more about the lives of extinct animals.

It is not only fossilized bones and skeletons that tell us about the animals of the past. Fossil footprints tell us about the way they walked, how tall they were and what kind of environment they preferred.

EGG-CITING FINDS

Eggs and nests are very important too. They tell us about the breeding patterns of animals and the development of their young.

EGGY ANSWERS

Fossil eggs can pose problems to the experts. It is almost impossible to tell which animal laid the eggs. The first dino eggs were found in the 1920s. The experts assumed they were laid by *Protoceratops* because so many skeletons of this dinosaur were found nearby, but this is not proof. The eggs are still being tested.

FAVOURITE PLACES

Sauropod footprints are usually found on prehistoric lake shores or beaches. Ornithopod footprints are often found in river sediments.

BIG FOOT

The biggest ever dinosaur tracks have been found in Early Jurassic rocks in Switzerland. They are 1.2m wide and were made by a sauropod walking across a muddy lake bed.

SEALED FATE

Segnosaur eggs, 10cm in diameter, were found in 1988. Some eggs contained skeletons of dinosaur embryos. In others, the bones were all jumbled up and mixed with beetle droppings. It may be that a beetle bored into the egg and laid its own eggs inside. The beetle grubs would have fed on the dinosaur embryo.

AMBUSH!

In most fossil sites, about 20 per cent of the dinosaur tracks are made by meat-eaters. But in some Triassic and Early Jurassic rocks in New Jersey, USA, about 40 per cent of the tracks were made by meat-eaters. It may be that they were staking out waterholes, waiting to ambush the plant-eaters.

TINY BUT TOUGH

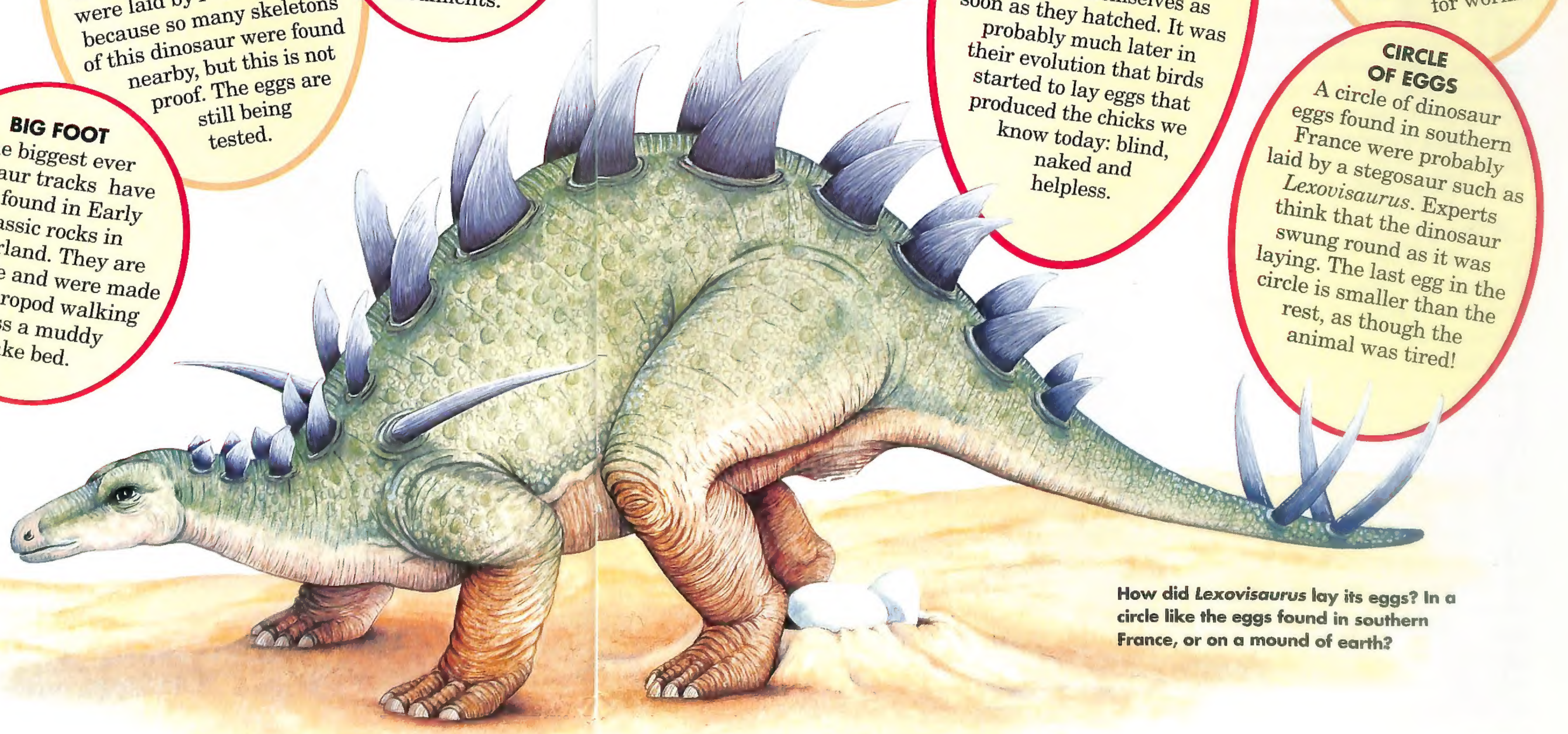
Bird eggs, 3.5cm long, were found in Cretaceous rocks in the Gobi Desert. They contained well-developed chicks. These babies would have been able to look after themselves as soon as they hatched. It was probably much later in their evolution that birds started to lay eggs that produced the chicks we know today: blind, naked and helpless.

OLD BIRDS

Footprints of all sorts of Cretaceous wading birds have been found in Korea. The big prints are quite separate from the small prints. This suggests that short-legged birds fed in shallow water and long-legged birds fed in deeper water. Worm burrows were found nearby. The birds may have been digging for worms.

CIRCLE OF EGGS

A circle of dinosaur eggs found in southern France were probably laid by a stegosaur such as *Lexovisaurus*. Experts think that the dinosaur swung round as it was laying. The last egg in the circle is smaller than the rest, as though the animal was tired!



How did *Lexovisaurus* lay its eggs? In a circle like the eggs found in southern France, or on a mound of earth?

A taste for adventure

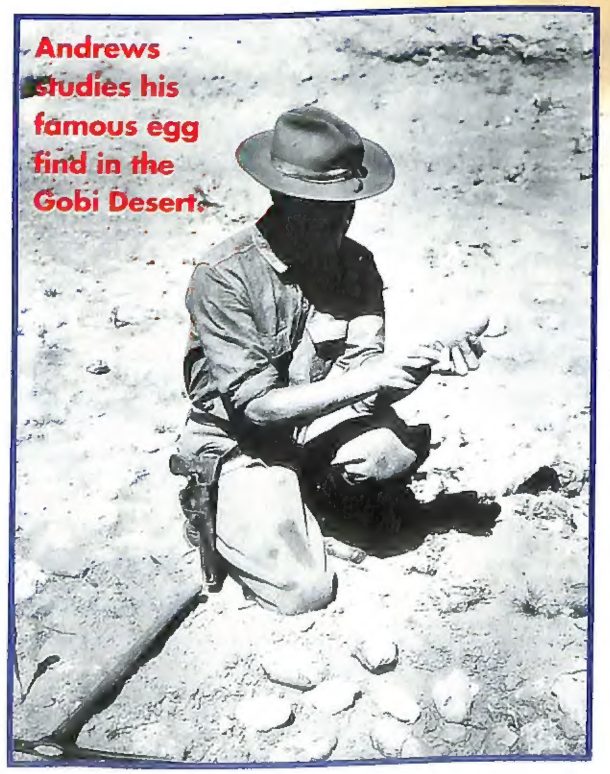
Saurornithoides was one of Andrews' many finds.

Roy Chapman Andrews was one of the most daring and successful dinosaur hunters.

This great adventurer once wrote: 'In the painted desert of the Gobi; in the steaming Borneo jungles; among palm trees on the enchanted islands of the East Indies; in the Himalayas – wherever I had made my little campfire was home.'

UNUSUAL MAN

For many years Andrews led a story-book life, travelling the world on expeditions for the American Museum of Natural History. In his wide-brimmed hat, jodhpurs and boots, with a gun slung at his side in a holster, Andrews dressed more like a big game hunter than the zoologist who became famous for the discovery of the first dinosaur eggs. Andrews was so dashing that he was the inspiration for the great film hero, Indiana Jones.



Andrews studies his famous egg find in the Gobi Desert.

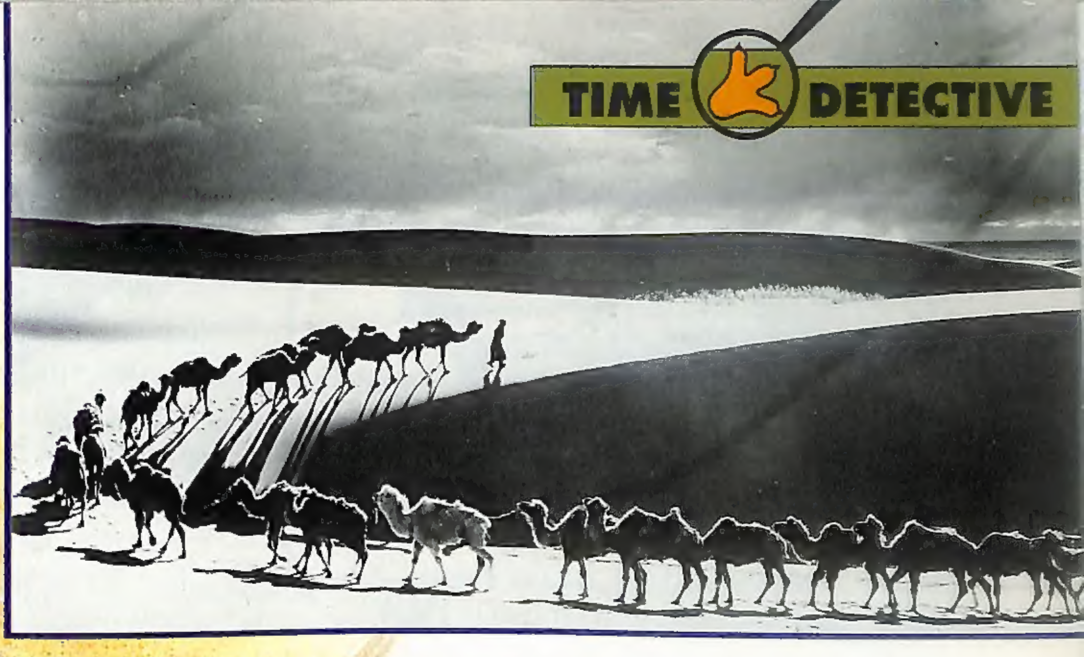
Andrews' expedition to Mongolia found a mass *Protoceratops'* grave in the Gobi Desert. It is now thought that the dinosaurs died in a sandstorm.

AMERICAN EXPLORER

Andrews had always wanted to explore the world's wild places: 'I wanted it so intensely that, had I been within the four walls of an office, I certainly should have sickened and died.'

I HATE SCHOOL

Every moment at school in Wisconsin, USA, was torture for Andrews. He longed to be outside, and spent his time in his canoe or walking with field glasses and a notebook, observing the natural world. He stuck school long enough to go to Beloit College in Wisconsin. When he graduated in 1906, he went to work at the American Museum of Natural History in New York. Two years later Chapman went off on his first great adventure – a trip to Alaska.



Andrews used both cars and camels (right) on his expeditions in Mongolia.

EXPLORING THE WORLD

In 1909 Andrews sailed to the Dutch East Indies. In 1912 he went exploring in northern Korea. He went back to Alaska in 1913. He specialised in the study of whales, which was dangerous work. Andrews was nearly killed when his small boat was charged by a wounded whale.

IT'S A FACT

ROY CHAPMAN ANDREWS' EXPEDITION PLAN

REGULATIONS

- No cussing the weather.
- No insinuations if there's sand in the soup.
- No grouching against gasoline (petrol) in the water.
- If members of the expedition cannot supply fresh meat on any one day they will not be allowed to smoke after dinner.

AIMS

- To have a thoroughly good time.

'OUR GREAT ADVENTURE'

Eventually, Roy Chapman Andrews became head of Asiatic exploration at the American Museum of Natural History and led major expeditions to Asia. The most famous of all his journeys, the Central Asian Expedition, began in 1922 and lasted until 1925.

The terrifying predator *Tarbosaurus* was discovered in Mongolia during Andrews' Central Asian Expedition.

THE BACK OF BEYOND

Mongolia was a dangerous country in those days. There were no railways and few roads and towns. The vast Gobi Desert covered much of it. It was swept by winds and sandstorms and could be intensely cold or hot. It was unmapped and unknown except to the Mongols who lived a nomadic life there.

***Oviraptor* was one of many dinosaurs and prehistoric creatures found during the Mongolian expedition in the 1920s.**

DANGER ALL AROUND

Armed bandits roamed the country. There was hardly any water, no shelter and very little food. Andrews wanted to take an expedition of 26 scientists and technicians, plus food and equipment, into this wasteland for five months. How was he going to do it?

CAMP COMFORTS

'I don't believe in hardships, they are a nuisance,' wrote Roy Chapman Andrews. His solution was to bring every modern invention for camp comfort. This included folding chairs and tables, camp beds and even a phonograph for playing music!

MASTER PLANNER

Another stroke of Andrews' genius was to take cars. They had not been used on an expedition before. They were supported by a caravan of 75 camels laden with essentials such as petrol and food. The scientists drove through the desert in the cars while the camels carried supplies between the camps.

GREAT DISCOVERIES

The expedition was a great success. They found the first dinosaur eggs, as well as many dinosaur fossils including *Protoceratops*, *Pinacosaurus*, *Oviraptor* *Saurornithoides*, *Velociraptor* and *Tarbosaurus*.

Andrews' expeditions to Mongolia were hard work. Here the team are pushing one of the trucks through a sandstorm.

A HARD LIFE

The expedition wasn't all fun – cars got stuck in mud and quicksand. Whirlwinds wrecked camps, sucking clothes and plates of food hundreds of feet into the air. People's clothes were ripped off and grit lashed their skin.

IT'S A FACT

LETTER FROM AMERICA

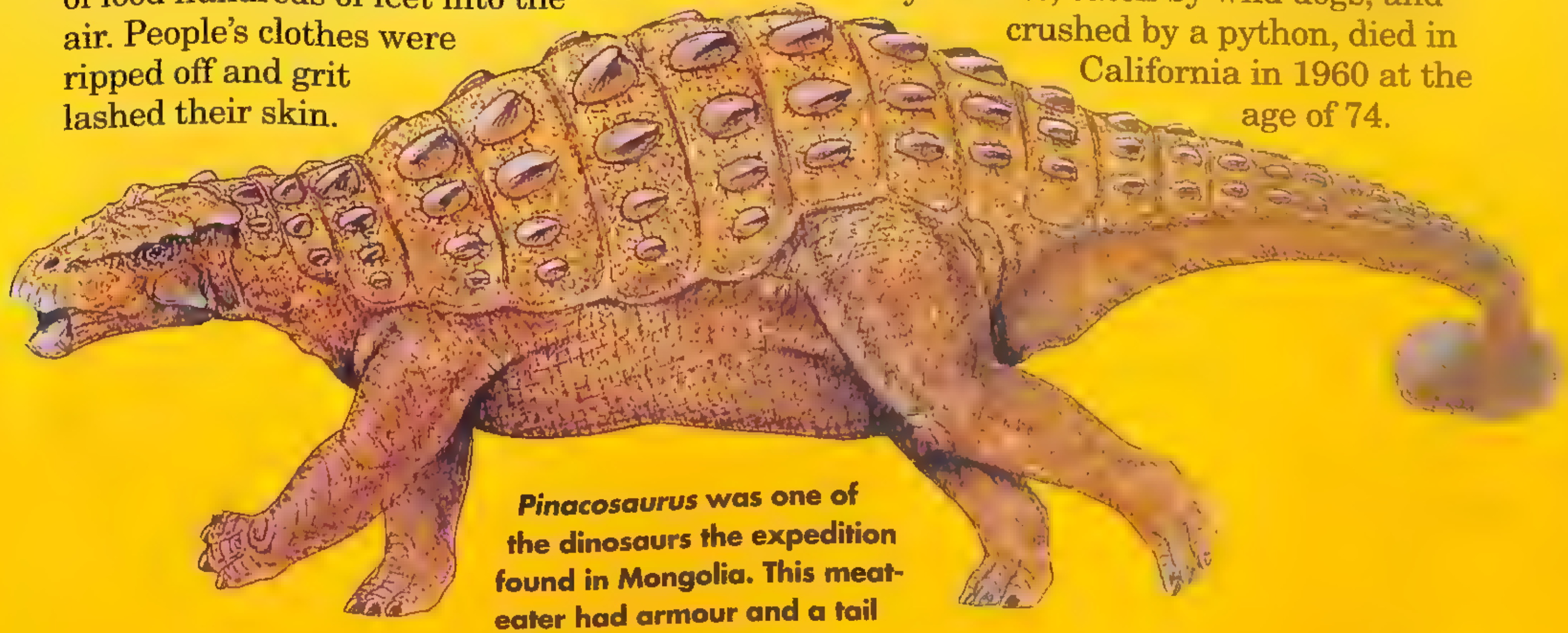
A remarkable letter reached Andrews at a camp in the Gobi Desert. It had travelled thousands of miles from the USA addressed simply: 'Roy Chapman Andrews Esq, Anywhere in Mongolia.'

PYJAMAS TO THE RESCUE

Once, a supply caravan got held up and the material used to protect the fossils ran out. Everyone gave a piece of clothing to finish the job. 'There is in the collection,' wrote Andrews, 'a beautiful dinosaur fortified with strips from my pyjamas.'

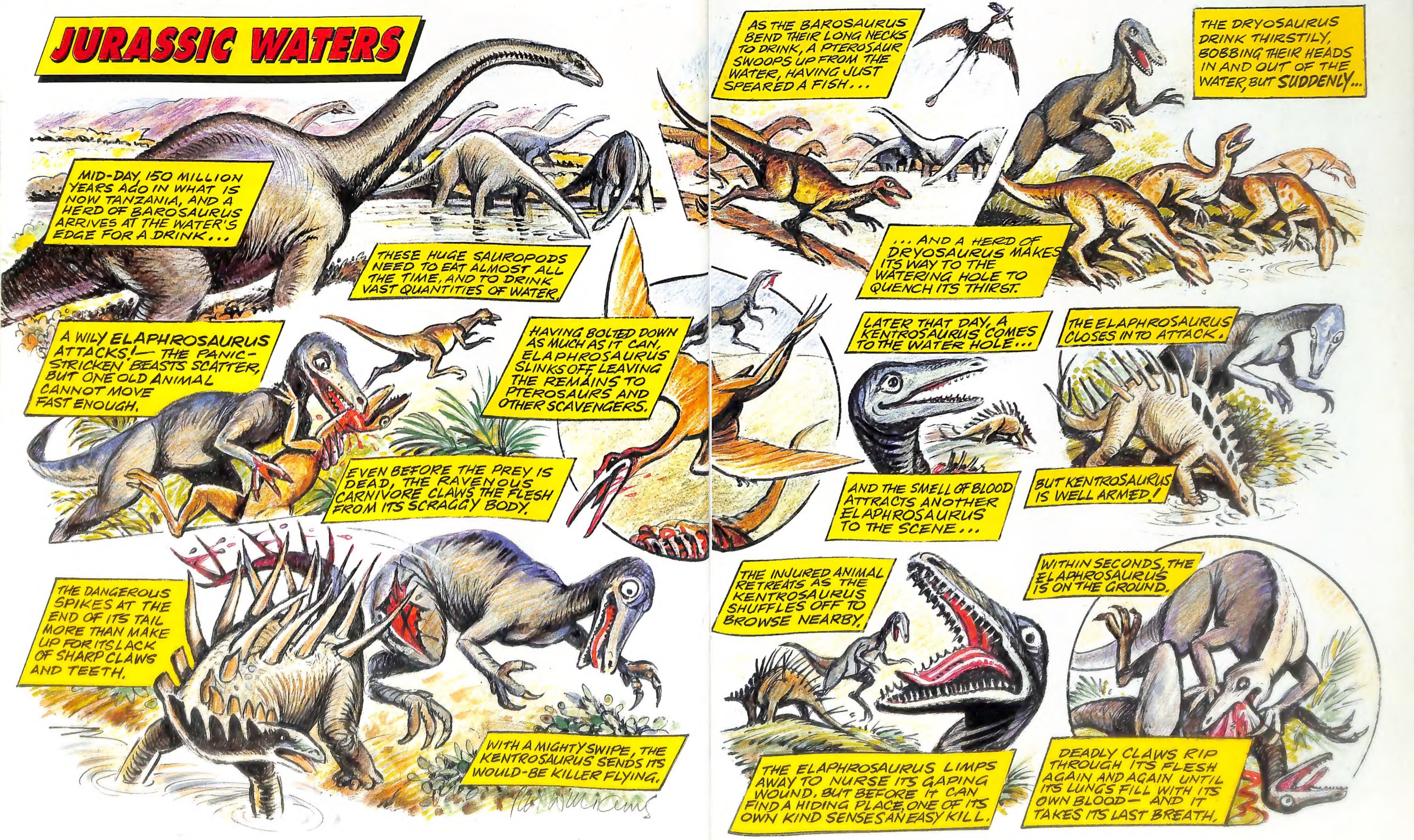
HOME AT LAST

In 1935, Roy Chapman Andrews gave up the life of a dashing explorer to become director of the American Museum of Natural History in New York. In 1942 he resigned to go and write books. The great adventurer, who had almost drowned in a typhoon, been killed by a whale, murdered by bandits, eaten by wild dogs, and crushed by a python, died in California in 1960 at the age of 74.



***Pinacosaurus* was one of the dinosaurs the expedition found in Mongolia. This meat-eater had armour and a tail club to protect it.**

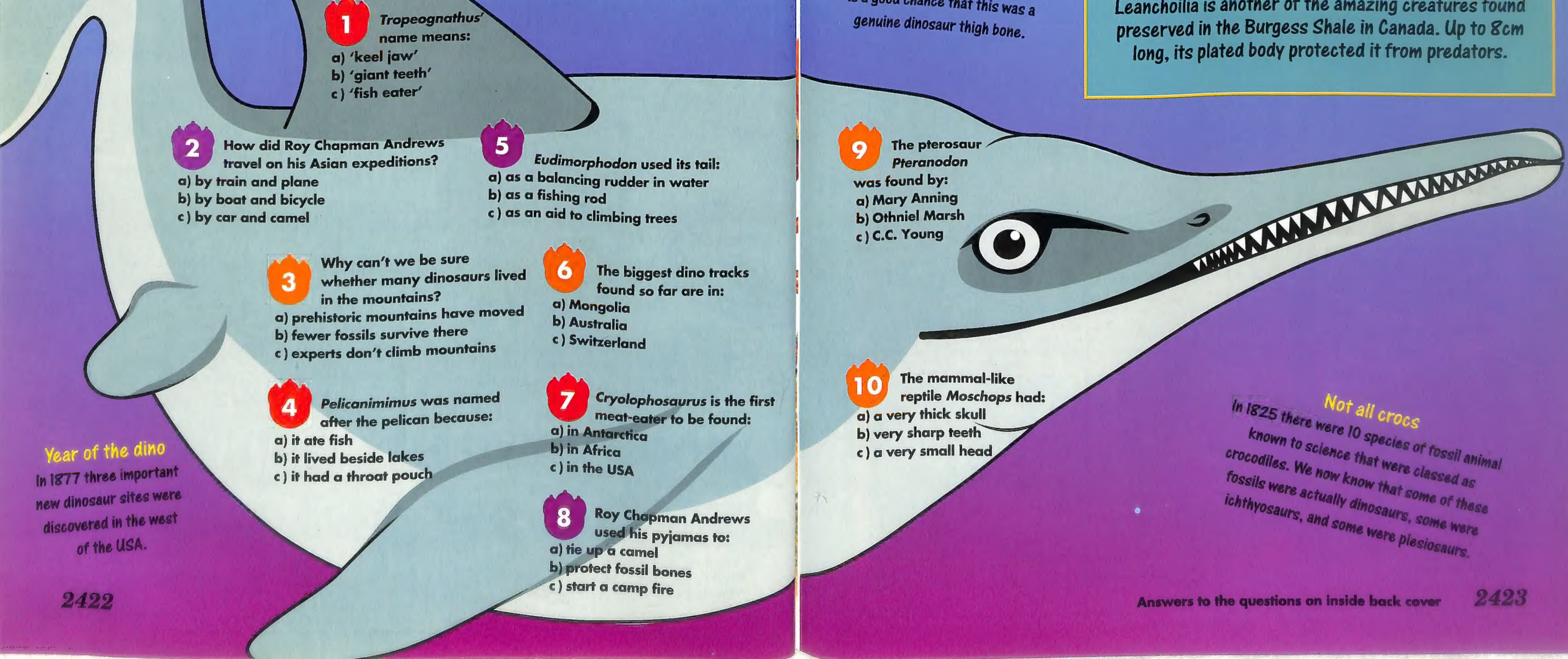
JURASSIC WATERS


MID-DAY, 150 MILLION YEARS AGO IN WHAT IS NOW TANZANIA, AND A HERD OF BAROSAURUS ARRIVES AT THE WATER'S EDGE FOR A DRINK...
THESE HUGE SAUROPODS NEED TO EAT ALMOST ALL THE TIME, AND TO DRINK VAST QUANTITIES OF WATER.
AS THE BAROSAURUS BEND THEIR LONG NECKS TO DRINK, A PTEROSAUR SWOOPS UP FROM THE WATER, HAVING JUST SPEARED A FISH...
...AND A HERD OF DRYOSAURUS MAKES ITS WAY TO THE WATERING HOLE TO QUENCH ITS THIRST.
THE DRYOSAURUS DRINK THIRSTILY, BOBBING THEIR HEADS IN AND OUT OF THE WATER, BUT SUDDENLY...
A WILY ELAPHROSAURUS ATTACKS! — THE PANIC-STRICKEN BEASTS SCATTER, BUT ONE OLD ANIMAL CANNOT MOVE FAST ENOUGH.
EVEN BEFORE THE PREY IS DEAD, THE RAVENOUS CARNIVORE CLAWS THE FLESH FROM ITS SCRAGGY BODY.
HAVING BOLTED DOWN AS MUCH AS IT CAN, ELAPHROSAURUS SLINKS OFF LEAVING THE REMAINS TO PTEROSAURS AND OTHER SCAVENGERS.
LATER THAT DAY, A KENTROSAURUS COMES TO THE WATER HOLE...
AND THE SMELL OF BLOOD ATTRACTS ANOTHER ELAPHROSAURUS TO THE SCENE...
THE ELAPHROSAURUS CLOSES IN TO ATTACK.
BUT KENTROSAURUS IS WELL ARMED!
THE DANGEROUS SPIKES AT THE END OF ITS TAIL MORE THAN MAKE UP FOR ITS LACK OF SHARP CLAWS AND TEETH.
WITH A MIGHTY SWIPE, THE KENTROSAURUS SENDS ITS WOULD-BE KILLER FLYING.
THE INJURED ANIMAL RETREATS AS THE KENTROSAURUS SHUFFLES OFF TO BROWSE NEARBY.
THE ELAPHROSAURUS LIMPS AWAY TO NURSE ITS GAPING WOUND, BUT BEFORE IT CAN FIND A HIDING PLACE, ONE OF ITS OWN KIND SENSES AN EASY KILL.
WITHIN SECONDS, THE ELAPHROSAURUS IS ON THE GROUND.
DEADLY CLAWS RIP THROUGH ITS FLESH AGAIN AND AGAIN UNTIL ITS LUNGS FILL WITH ITS OWN BLOOD — AND IT TAKES ITS LAST BREATH.

Improve and test your knowledge

FACT FILE

Ichthyosaurus holds all the answers. See how you score in the quiz.



Brittle bones

A fossilized skeleton of an ornithopod dinosaur was found on Vega Island in Antarctica in 1989. The dinosaur was like a small version of Iguanodon. The bones had all been shattered by the frost and were extremely difficult to remove from the rock.

1 *Tropeognathus'* name means:
a) 'keel jaw'
b) 'giant teeth'
c) 'fish eater'

2 How did Roy Chapman Andrews travel on his Asian expeditions?
a) by train and plane
b) by boat and bicycle
c) by car and camel

3 Why can't we be sure whether many dinosaurs lived in the mountains?
a) prehistoric mountains have moved
b) fewer fossils survive there
c) experts don't climb mountains

4 *Pelicanimimus* was named after the pelican because:
a) it ate fish
b) it lived beside lakes
c) it had a throat pouch

5 *Eudimorphodon* used its tail:
a) as a balancing rudder in water
b) as a fishing rod
c) as an aid to climbing trees

6 The biggest dino tracks found so far are in:
a) Mongolia
b) Australia
c) Switzerland

7 *Cryolophosaurus* is the first meat-eater to be found:
a) in Antarctica
b) in Africa
c) in the USA

8 Roy Chapman Andrews used his pyjamas to:
a) tie up a camel
b) protect fossil bones
c) start a camp fire

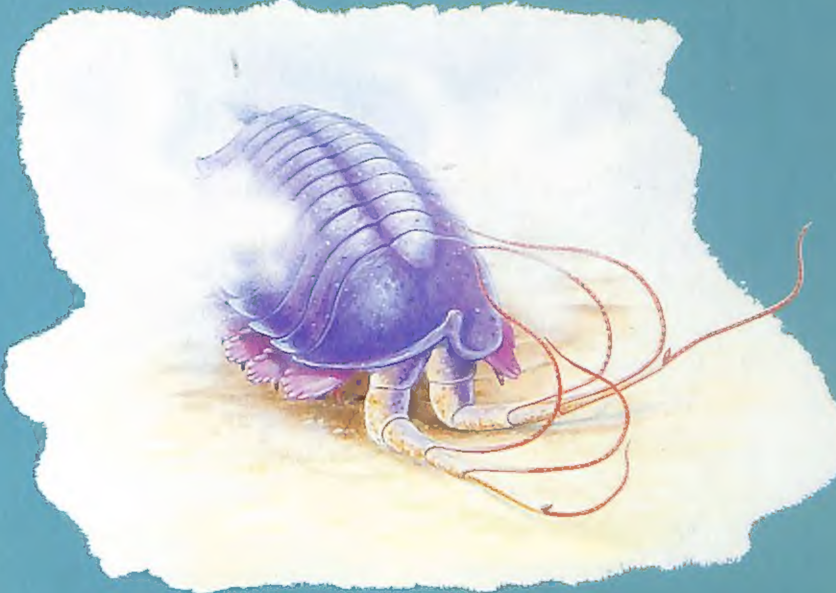
Year of the dino

In 1877 three important new dinosaur sites were discovered in the west of the USA.

First American find

The first recorded dinosaur find in the USA was probably documented by Dr Caspar Wistar in 1787. He reported to the American Philosophical Society on a thigh bone found in New Jersey. Unfortunately, the bone and his description are both now lost. But the thigh bone was discovered in an area where many dinosaurs have been discovered since, so there is a good chance that this was a genuine dinosaur thigh bone.

Burgess shale bug



Leanchoilia is another of the amazing creatures found preserved in the Burgess Shale in Canada. Up to 8cm long, its plated body protected it from predators.

9 The pterosaur *Pteranodon* was found by:
a) Mary Anning
b) Othniel Marsh
c) C.C. Young

10 The mammal-like reptile *Moschops* had:
a) a very thick skull
b) very sharp teeth
c) a very small head

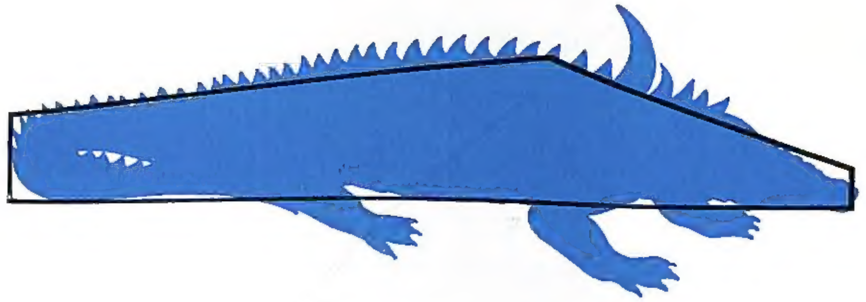
Not all crocs

In 1825 there were 10 species of fossil animal known to science that were classed as crocodiles. We now know that some of these fossils were actually dinosaurs, some were ichthyosaurs, and some were plesiosaurs.

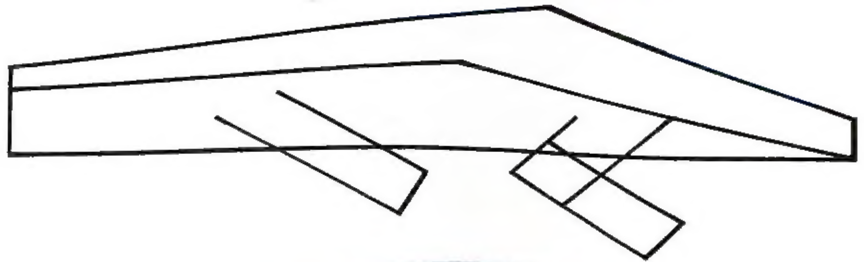
Answers to the questions on inside back cover

DESMATOSUCHUS

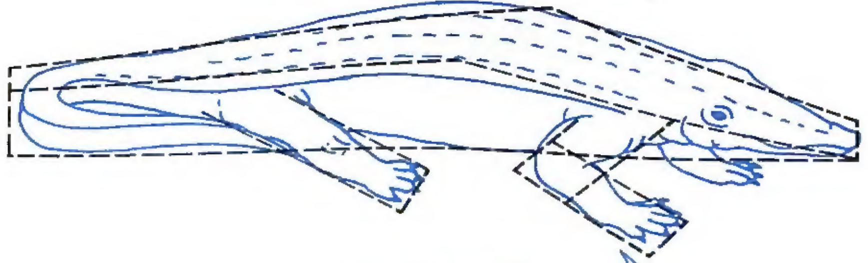
1 Sketch a long, thin rectangle-like shape in the middle of your paper. Make the top a bit pointed so it slopes like the roof of a long building.



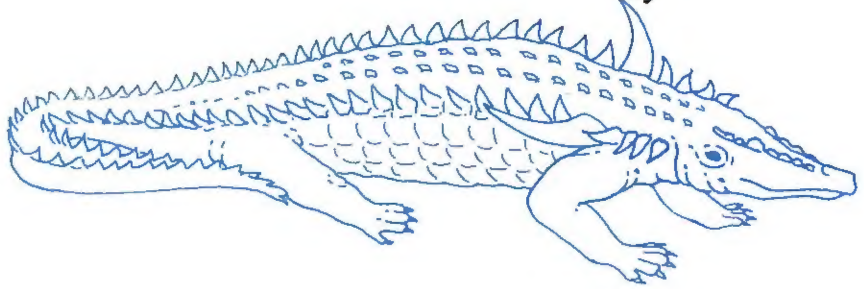
2 Add small rectangles for the legs. Draw another line inside the roof shape. The space between the lines is for the reptile's back.

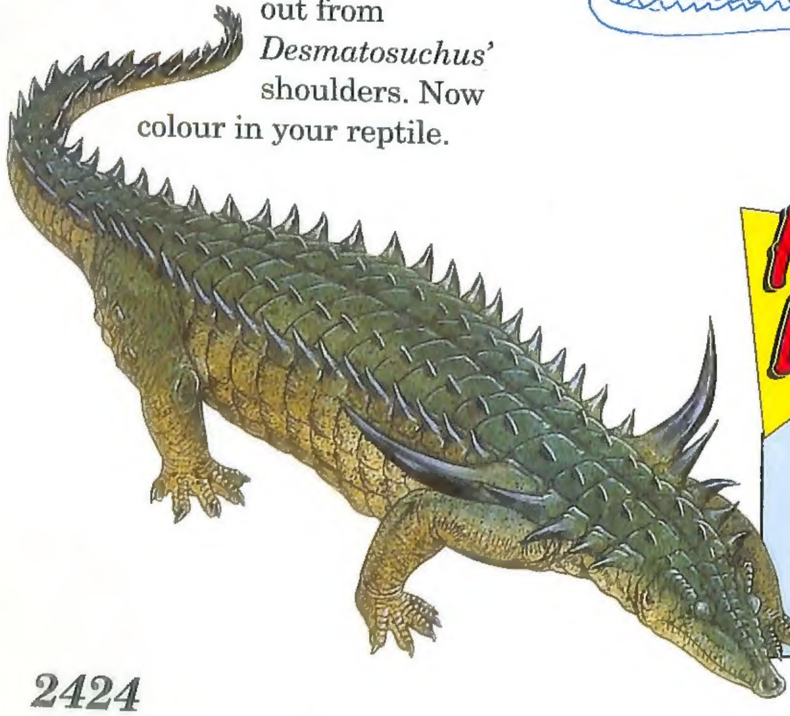


3 Now draw *Desmatosuchus'* outline smoothly, following the guidelines you drew in steps 1 and 2. Add details such as the tail and the amazing armoured skin.



4 Finish off by drawing the tusk-like spines jutting out from *Desmatosuchus'* shoulders. Now colour in your reptile.





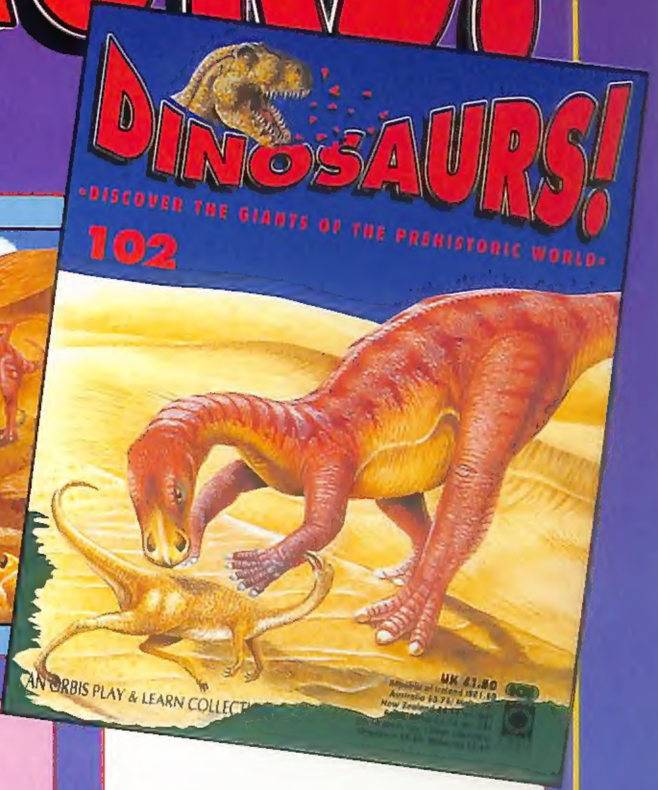
Fact box

Desmatosuchus was a plant-eating reptile protected by bony armour and spines.

- **NAME:** Desmatosuchus (des-mat-oh-soo-kus) means 'musk crocodile'
- **GROUP:** reptile
- **SIZE:** up to 1.3m long
- **FOOD:** plants
- **LIVED:** Late Triassic North America

COMING IN PART 102 OF

DINOSAURS!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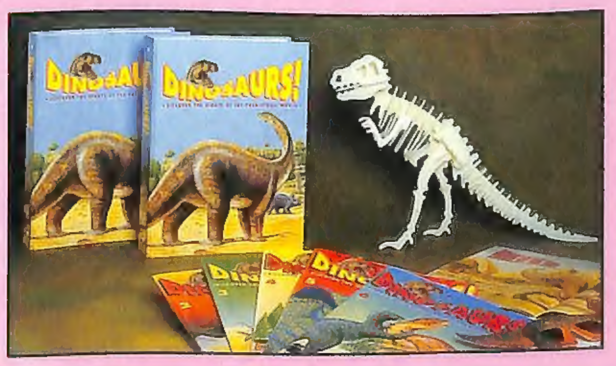

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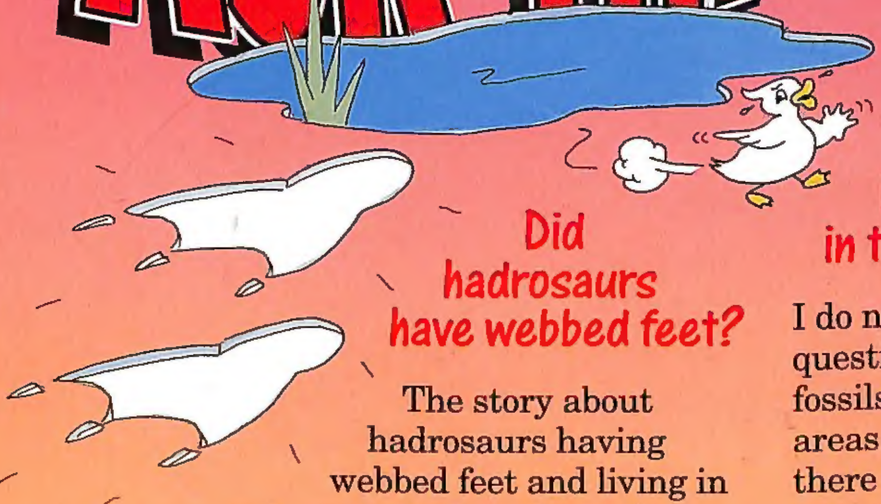
ANSWERS TO FACT FILE QUESTIONS: 1.a 2.c 3.b 4.c 5.a 6.c 7.a 8.b 9.b 10.a

Dr David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT

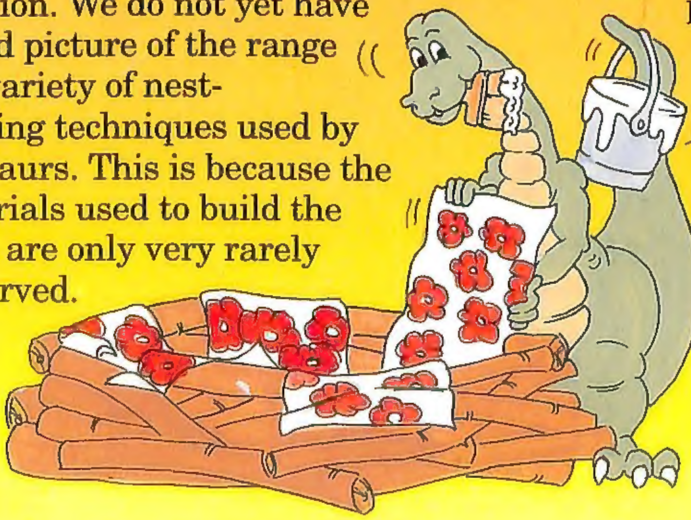


Did hadrosaurs have webbed feet?

The story about hadrosaurs having webbed feet and living in water goes back to the earliest discoveries of these dinosaurs. Mummified hadrosaur remains discovered in Canada seemed to prove that they had webbed hands. The skin around the hands was flattened and joined together. However, recent work suggests that this mummified skin was actually formed from the pads, like those you see on cats' paws, found beneath each of the hadrosaur's toes.

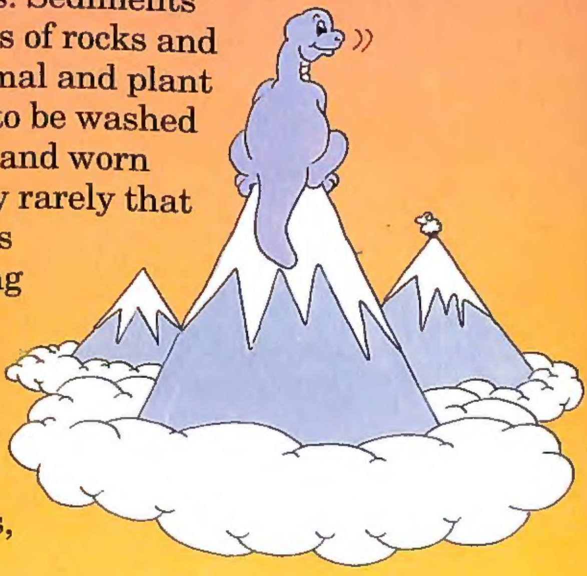
Did dinosaurs decorate their nests as some birds do today?

I simply do not know the answer to this question. We do not yet have a good picture of the range and variety of nest-building techniques used by dinosaurs. This is because the materials used to build the nests are only very rarely preserved.



Did any dinosaurs live high up in the mountains?

I do not really have an answer to this question. It is an unfortunate fact that fossils only tend to be preserved in lowland areas. That means we find fossils where there were once ponds, lakes, river banks or river valleys. Sediments (small particles of rocks and sand) and animal and plant remains tend to be washed off mountains and worn away. It is only rarely that this material is preserved along with lowland fossils. It has been suggested that some rare dinosaurs, such as pachycephalosaurs, which are thought to have lived a bit like sheep and goats today, lived in mountainous areas. This would explain why their remains have seldom been found, but this is guesswork of course.



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